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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,027	01/29/2004	Joan Leslie Winnett Bender	CET-026431 CIP	4708
<div>7590 01/14/2008</div> <div>John S. Beulick Armstrong Teasdale LLP Suite 2600 One Metropolitan St. Louis, MO 63102</div> <div>EXAMINER VORTMAN, ANATOLY</div> <div>ART UNIT PAPER NUMBER</div> <div>2835</div> <div>MAIL DATE DELIVERY MODE</div> <div>01/14/2008 PAPER</div>				

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/767,027	Applicant(s) BENDER ET AL.	
	Examiner Anatoly Vortman	Art Unit 2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 10, 11, 15-25 and 30-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12-14, 26-29, 37 and 38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Reply Under 37 CFR 1.111

1. The submission of the reply filed on 11/30/07 to the non-final Office action of 08/30/07 is hereby acknowledged. Claims 1-38 are pending in the instant application. Claims 10, 11, 15-25, and 30-36 have been previously withdrawn from further consideration as drawn to the non-elected invention. The Office action follows:

Claim Objections

2. Claim 4 is objected to because of the following informalities: claim recites that "said low resistance fuse has thickness of about 0.0005 inches or less". However, the specification of the instant application teaches only that "the polymer membrane 202 is a thin membrane having a thickness of about .0005 inches or less" (see [00103]). Therefore, claim has been interpreted accordingly. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1, 4, 6-9, 12, 37, and 38, are rejected under 35 U.S.C. 102(b) as being anticipated by US/5,914,649 to Isono et al (of record).

Regarding claims 1, 6, 12, 37, Isono disclosed (Fig. 3A-3G) a low resistance fuse comprising: a polymer membrane (103) a thin foil fuse element layer (102) formed on said polymer membrane (103) to form a fuse-polymer layer (102, 103); first and second intermediate insulation layers (101, 200) extending on opposite sides of said fuse-polymer layer (102, 103) and coupled thereto, wherein at least one of said first and second intermediate insulation layers (101, 200) comprises an opening (104) therethrough; first and second outer insulation layers (302) laminated to said first and second intermediate insulation layers (101, 200), wherein said fuse-polymer layer (102, 103) and said opening (104) are configured to model an adiabatic envelope around a portion of said fuse-polymer layer (102, 103) in a vicinity of said opening (inherently, since the portion of the fuse-polymer layer (102, 103) in the vicinity of the openings (104) is completely enclosed by the insulation layers (101, 200, and 302), said enclosed space constitutes the adiabatic envelope).

Regarding claim 4, Isono disclosed that the polymer membrane (103) has a thickness of about .0005 inches or less (col. 7, lines 60+. Please note that the range of 5 micron to 200 micron includes the range of 5 micron to 12, 7 micron, which is less than about .0005 inches). Further, "prior art which teaches a range [...] overlapping [...] the claimed range anticipates" (MPEP 2131.03 (I)(II)). Further, see objection to claim 4 above).

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Regarding claims 7, 8, and 38, Isono disclosed that said thin foil fuse element layer (103) has a thickness between about 1 to about 20 microns or between about 3 to about 9 microns (i.e., 3-8 microns, col. 2, lines 45+). Please note, that "prior art which teaches a range within [...] the claimed range anticipates" (MPEP 2131.03 (I)(II)).

Regarding claim 9, Isono disclosed that said fuse element layer (102) comprises first and second contact pads (3) and at least one fusible link (4) extending therebetween (Fig. 3I).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isono in view of either US/5977860 or US/5699032 to Ulm Jr. et al., (Ulm) (both of record and cited in parent application No. 10/339,114).

Regarding claims 2 and 14, Isono disclosed all as applied to claims 1 and 12, respectively, but did not disclose that said outer and intermediate insulating layers and said polymer membrane are made from polyimide. Ulm teaches surface mount fuses with layered constructions (Fig. 5), wherein a substrate (4) and an insulating layer (40) are made of polyimide material (see Ulm '032, column 3, lines 45+ and column 5, lines 44+; see Ulm '860, column 3, lines 60+, column 5, lines 61+). Ulm further teaches that polyimide has good thermal insulation

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properties (see Ulm '032, column 5, lines 49+; see Ulm '860, column 5, lines 65+, column 6, lines 1+). Since fuses of Ulm and of Isono are from the same field of endeavor (i.e. surface mount fuses having layered construction), the purpose of making insulating layers of fuses from polyimide taught by Ulm would be recognized in the fuse of Isono. It would have been obvious to one having ordinary skill in the fuse art at the time the invention was made to select polyimide for making the insulating layers and the polymer membrane of the fuse of Isono, as taught by Ulm, in order to provide sufficient thermal insulation between layers and to achieve desired current breaking characteristics of the fuse.

7. Claims 3 and 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isono in view of US/5,309,625 to Onishi (of record).

Regarding claims 3 and 13, Isono disclosed all as applied to claims 1 and 12, respectively, but did not disclose that said outer and intermediate insulating layers and said polymer membrane are made from liquid crystal polymer.

Onishi teaches surface mount fuses with layered constructions (Fig. 1, 2), wherein a substrate (1) is made of liquid crystal polymer, because of good heat resisting properties of the latter (column 2, lines 59-66). Since fuses of Onishi and of Isono are from the same field of endeavor (i.e. surface mount fuses having layered construction), the purpose of making insulating layers of fuses from liquid crystal polymer taught by Onishi would be recognized in the fuse of Isono. It would have been obvious to one having ordinary skill in the fuse art at the time the invention was made to select liquid crystal polymer for making the insulating layers and

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the polymer membrane of the fuse of Isono, as taught by Onishi, in order to provide sufficient thermal insulation and to achieve desired current breaking characteristics of the fuse.

8. Claims 5, 26, and 27, are rejected under 35 U.S.C. 103(a) as being unpatentable over Isono in view of US/4,388,603 to Hassler et al., (Hassler) (of record).

Regarding claims 5 and 26, in relation to claim 5 Isono disclosed all as applied to claim 1 above, and in relation to claim 26 Isono disclosed (Fig. 3A-3G) a low resistance fuse comprising: a polymer membrane (103) a thin foil fuse element layer (102) formed on said polymer membrane (103) to form a fuse-polymer layer (102, 103); first and second intermediate insulation layers (101, 200) extending on opposite sides of said fuse-polymer layer (101, 200) and coupled thereto, wherein at least one of said first and second intermediate insulation layers (101, 200) comprises an opening (104) therethrough.

Regarding claims 5 and 26 Isono did not disclose an arc quenching media located within said opening and surrounding said fuse element layer within said opening.

Hassler disclosed an electrical fuse (Fig. 1) comprising a fusible element (13) surrounded by an arc quenching media (23) to isolate arcing (column 3, lines 27+).

It would have been obvious to a person of ordinary skill in the fuse art at the time of the invention to fill said opening of Isono with the arc quenching media as taught by Hassler in order to isolate and quench arcs, thus preventing the destruction of the fuse and accidental reconnections of the fusible element (via arcs).

Regarding claim 27, Isono as modified by Hassler disclosed that said thin foil fuse element layer (103) has a thickness between about 1 to about 20 microns (i.e., 3-8 microns, col.

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2, lines 45+). Please note, that “prior art which teaches a range within [...] the claimed range anticipates” (MPEP 2131.03 (I)(II)).

9. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isono in view of Hassler as applied to claim 26 above, and further in view of either US/5977860 or US/5699032 to Ulm Jr. et al., (Ulm) (both of record and cited in parent application No. 10/339,114).

Regarding claim 28, Isono modified by Hassler disclosed all as applied to claim 26, but did not disclose that said outer and intermediate insulating layers are made from polyimide. Ulm teaches surface mount fuses with layered constructions (Fig. 5), wherein a substrate (4) and an insulating layer (40) are made of polyimide material (see Ulm '032, column 3, lines 45+ and column 5, lines 44+; see Ulm '860, column 3, lines 60+, column 5, lines 61+). Ulm further teaches that polyimide has good thermal insulation properties (see Ulm '032, column 5, lines 49+; see Ulm '860, column 5, lines 65+, column 6, lines 1+). Since fuses of Ulm and of Isono-Hassler combination are from the same field of endeavor (i.e. surface mount fuses having layered construction), the purpose of making insulating layers of fuses from polyimide taught by Ulm would be recognized in the Isono-Hassler combination. It would have been obvious to one having ordinary skill in the fuse art at the time the invention was made to select polyimide for making the insulating layers of the fuse of Isono-Hassler combination, as taught by Ulm, in order to provide sufficient thermal insulation between layers and to achieve desired current breaking characteristics of the fuse.

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10. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isono in view of Hassler as applied to claim 26 above, and further in view of US/5,309,625 to Onishi.

Regarding claim 29, Isono modified by Hassler disclosed all as applied to claim 26, but did not disclose that said outer and intermediate insulating layers are made from liquid crystal polymer.

Onishi teaches surface mount fuses with layered constructions (Fig. 1, 2), wherein a substrate (1) is made of liquid crystal polymer, because of good heat resisting properties of the latter (column 2, lines 59-66). Since fuses of Onishi and of Isono-Hassler combination are from the same field of endeavor (i.e. surface mount fuses having layered construction), the purpose of making insulating layers of fuses from liquid crystal polymer taught by Onishi would be recognized in the Isono-Hassler combination. It would have been obvious to one having ordinary skill in the fuse art at the time the invention was made to select liquid crystal polymer for making the insulating layers of the Isono-Hassler combination, as taught by Onishi, in order to provide sufficient thermal insulation and to achieve desired current breaking characteristics of the fuse.

Response to Arguments

11. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

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12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-2047. The examiner can normally be reached on Monday-Thursday, between 10:00 am and 8:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Jayprakash Gandhi can be reached on 571-272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anatoly Vortman/
Primary Examiner
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AV